Learn Java: Variables and Data Types

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`int` Data Type

In Java, the `int` datatype is used to store integer values. This means that it can store all positive and negative whole numbers and zero.

```
int num1 = 10;   // positive value
int num2 = -5;   // negative value
int num3 = 0;    // zero value
int num4 = 12.5  // not allowed
```

`boolean` Data Type

In Java, the `boolean` primitive data type is used to store a value, which can be either `true` or `false`.

```
boolean result = true;
boolean isMarried = false;
```

`char` Data Type

In Java, `char` is used to store a single character. The character must be enclosed in single quotes.

```
char answer = 'y';
```

Java Strings

A String in Java is a Object that holds multiple characters. It is not a primitive datatype.

A String can be created by placing characters between a pair of double quotes (`"`).

To compare Strings, the `equals()` method must be used instead of the primitive equality comparator `==`.

```
// Creating a String variable
String name = "Bob";

// The following will print "false" because strings
are case-sensitive
System.out.println(name.equals("bob"));
```

Static Typing in Java

In Java, the type of a variable is checked at compile time. This is known as *static typing*. It has the advantage of catching the errors at compile time rather than at execution time.

Variables must be declared with the appropriate data type or the program will not compile.

```
int i = 10;          // type is int
char ch = 'a';       // type is char

j = 20;              // won't compile, no type is
given
char name = "Lil";   // won't compile, wrong data type
```

Primitive Data Types in Java

Java's most basic data types are known as *primitive data types* and are in the system by default.

The available types are as follows:

- `int`
- `char`
- `boolean`
- `byte`
- `long`
- `short`
- `double`
- `float`

`null` is another, but it can only ever store the value `null`.

```
int age = 28;

char grade = 'A';

boolean late = true;

byte b = 20;

long num1 = 1234567;

short no = 10;

float k = (float)12.5;

double num2 = 10.45678;
```

Math Operations in Java

In Java, basic math operations can be applied to `int`, `double` and `float` data types:

- `+` addition
- `-` subtraction
- `*` multiplication
- `/` division
- `%` modulo (yields the remainder)

These operations are not supported for other data types.

```
int a = 100;
int b = 20;

int result;

// some examples of basic math operations

result = a + b;  // result = 120

result = a - b;  // result = 80

result = a * b;  // result = 2000

result = a / b;  // result = 5

result = a % b;  // result = 0
```

Comparison Operators in Java

In Java, you can use `comparison operators` to compare two values. These are the available operators:

- `>` greater than
- `<` less than
- `>=` greater than or equal to
- `<=` less than or equal to
- `==` equal to
- `!=` not equal to

They are supported for primitive data types and the result of a comparison is a boolean value `true` or `false`.

```
int a = 5;
int b = 3;

boolean result = a > b;
// result now holds the boolean value true
```